Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

204. Proposed by **W. J. GREENSTREET, M. A., Editor of The Mathematical Gazette, Stroud, England.**

A set of particles have coplanar motion due to mutual attractions. Each particle is now affected with a velocity V parallel to a fixed direction. How will this affect the angular momentum of the set about their centroid?

Solution by **G. B. M. ZERR, A. M., Ph. D., 4243 Girard Avenue, Philadelphia, Pa.**

The forces that produce the velocities would produce a velocity on the centroid in the same direction equal to the algebraic sum of all the velocities. As these forces (external) produce no moment about the centroid, or, in other words, the sum of all the momenta about the centroid is zero, the angular momenta of all the particles about the centroid is constant. (See Routh's *Dynamics of a Particle*, Art. 260, page 159.)

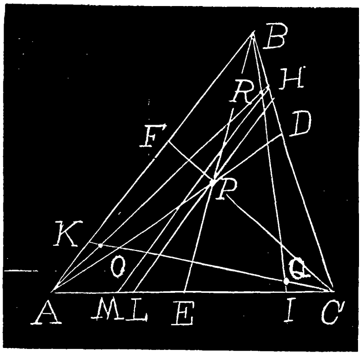
AVERAGE AND PROBABILITY.

189. Proposed by **G. B. M. ZERR, A. M., Ph. D., Philadelphia, Pa.**

(a) Lines are drawn from the vertices of a triangle through a random point within it. Find the average area of the triangle formed by joining the points of intersection of these lines with the opposite sides. (b) Lines are drawn from the vertices to points taken at random in the opposite sides of a triangle. Find the average area of the triangle formed by the intersections of these lines.

Solution by the **PROPOSER.**

(a) Let P be the random point in the given triangle, sides a, b, c. Draw AD, BE, CF, DE, EF, FD. Also draw PL parallel to AB. Let $AL=u$, $PL=v$.



Co-ordinates of E are $\left(\frac{cu}{c-v},\ 0\right)$; of F, $\left(0,\ \frac{bv}{b-u}\right)$; of D, $\left(\frac{bcu}{cu+bv},\ \frac{bcv}{cu+bv}\right)$.

Area $DEF=\dfrac{bcuv(bc-bv-cu)\sin A}{(c-v)(b-u)\ (cu+bv)}$ $=2\triangle G$, where $\triangle$=area of ABC.

Limits of u are 0 and b; of v, 0 and $\frac{c}{b}(b-u)=v_1$. Let A=average area.

$$\therefore A=\frac{2\triangle\int_0^b\int_0^{v_1}G\,du\,dv}{\int_0^b\int_0^{v_1}du\,dv}=\frac{4\triangle}{bc}\int_0^b\int_0^{v_1}G\,du\,dv$$

$$=\frac{4\triangle}{bc}\int_0^b\left(\frac{cu}{b}+\frac{2cu^2}{b^2-u^2}\log\frac{u}{b}\right)du=4\triangle\int_0^1\left(x+\frac{2x^2}{1-x^2}\log x\right)dx,\ \text{where } u=bx.$$